

NTSC

**BETACAM SP**

**BVW-60**

Betacam SP Studio Player



Sony  
Broadcast

**SONY**



# BVW-60

Sony expands the Betacam SP line-up with the BVW-60, a studio player VTR.

The BVW-60 is one of the latest VTRs based on the Betacam SP format, which was developed in response to market demands for a superior performance Betacam with longer operating time.

The BVW-60 can playback the superior picture quality of the Betacam SP format together with a total of four audio channels—two AFM audio channels and two longitudinal audio channels. A maximum of more than 90 minutes of operating time with the L-cassette is available. Of course, playback compatibility with conventional Betacam is maintained.

A selection of four Betacam SP studio VTRs, the BVW-60, BVW-65, BVW-70 and BVW-75, is now available from Sony, offering the variety needed to meet specific market requirements.

## Features

### Superior picture quality

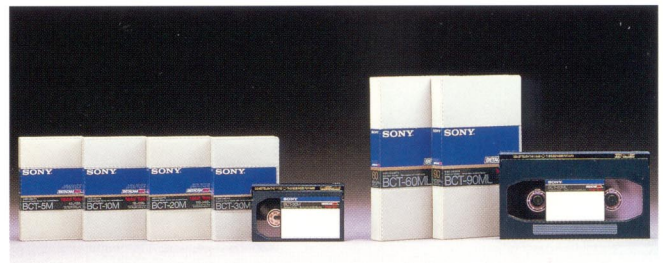
The BVW-60 will playback the superior picture quality which has become a reality with the adoption of the Betacam SP recording format and the use of metal particle tape. In the Betacam SP format, the FM carrier frequency allocation has been raised, thus making improvements possible, such as in the luminance bandwidth, signal to noise ratio, and the pulse and bar response in both the luminance and chrominance channels. All of the above characteristics determine the multi-generation picture performance.

Any existing Betacam VTR can playback metal particle tape recorded by the Betacam SP format without any problem. At the same time, the BVW-60 can also playback conventional Betacam format videocassettes which use oxide tape. The BVW-60 provides the selection of either metal particle tape or oxide tape for more flexible operation.

### Longer operating time

The BVW-60 will provide a maximum playback time of over 90 minutes of material recorded on L-size cassettes. In addition, the BVW-60 will accept S-size cassettes, which will provide more than 30 minutes of operating time, due to the newly developed videocassette compartment mechanism.

Sony offers a line-up of 5/10/20/30 minute Betacam SP videocassettes in the S size range and 60/90 minute videocassettes in the L size range.





## Multi-audio channels

In addition to the two conventional longitudinal audio channels, two AFM audio channels are added, making a total of four channels available. The two longitudinal audio channels are provided with the type-C Dolby\* NR (Noise Reduction) system. The BVW-60 will also reproduce the FM modulated audio simultaneously recorded with the video information by the rotary video head. The superior characteristics of the AFM channel, such as a wide dynamic range and small wow and flutter, will create new applications in broadcasting.

\*Dolby is a trademark of the Dolby Laboratories Licensing Corporation.

## Compact and lightweight

Although the BVW-60 provides a longer recording and playback time of 90 minutes, it is very compact. For instance, the height is 5 rack units—the same size as the BVW-10, the weight is approximately 27 kg (59 lb 8 oz.), and the power consumption is 160W. This is especially important when installing the VTRs in a VTR room or OB van. The BVW-60 will expand operational flexibility in field editing.

## High speed picture search

By using the search dial incorporated in the BVW-60, picture search is possible at various speeds (up to 24 times normal speed in forward and reverse). A color picture can be obtained at up to 5 times (24 times in monochrome) the normal speed in forward and reverse. In the jog mode, tape movement accurately follows the rotation of the search dial in both directions.

## Built-in time code reader

The reading of VITC and LTC in the SMPTE standards and user bits comes as a standard in the BVW-60.

## Character display

The BVW-60 is provided with a built-in character generator and characters can be superimposed via Video Output 3. It displays either time code reader data (VITC/LTC/U-BIT) or CTL timer data. Furthermore, function status and shuttle tape speed can also be displayed by setting the initial setup menu. When the BVW-60 is operated under the initial setup mode it automatically displays the initial setup menu.

## Color framing

Due to the principles of the component format, Betacam/Betacam SP VTRs are free from color framing as long as the recording component signals are fed directly from the component signal source. However, when recording or playing back decoded component signals, it is essential to match the decoding axis and encoding axis in order to keep video signal impairment to the minimum. The theory of color framing in the Betacam/

Betacam SP system is to match the CODEC axis.

The color framing of the Betacam SP in the NTSC color system is performed by a 4-field capstan servo which uses the CF (Color Framing) ID pulse in the 15th line of the B-Y vertical blanking interval as an off-tape color framing pulse. In addition, Betacam SP adopts the VISC (Vertical Interval Subcarrier) system which realizes superior composite signal output when a composite or decoded component signal is fed to the recorders. The VISC signal is recorded in the 11th line of the Y vertical blanking interval as the reference subcarrier phase. The BVW-60's encoding process will be based on the VISC signal information. The combined use of CF ID and VISC realizes a complete matching of CODEC axis assuring superior composite output signal.

## Audio system

### • Audio level control

The BVW-60 plays back a total of four channels of audio input and each channel of the audio level can be adjusted separately. A unique bargraph indicator, which is capable of displaying either the VU or PEAK mode

when selected via an internal switch, is provided for precise level setting. By pushing the control knobs, the audio level can be set to unity gain.



## Versatile system interface

### • RS-422 serial interface (9-pin)

An RS-422 serial interface is provided for versatile editing system expansion and flexible system control. The BVW-60 can be directly interfaced to other BVW series Betacam VTRs, including the BVW-70/75, as well as BVH-2000/3000 series 1-inch VTRs, U-matics and BVE series editing controllers.

### • 36-pin parallel interface

A 36-pin parallel interface is also provided for simpler remote control applications.

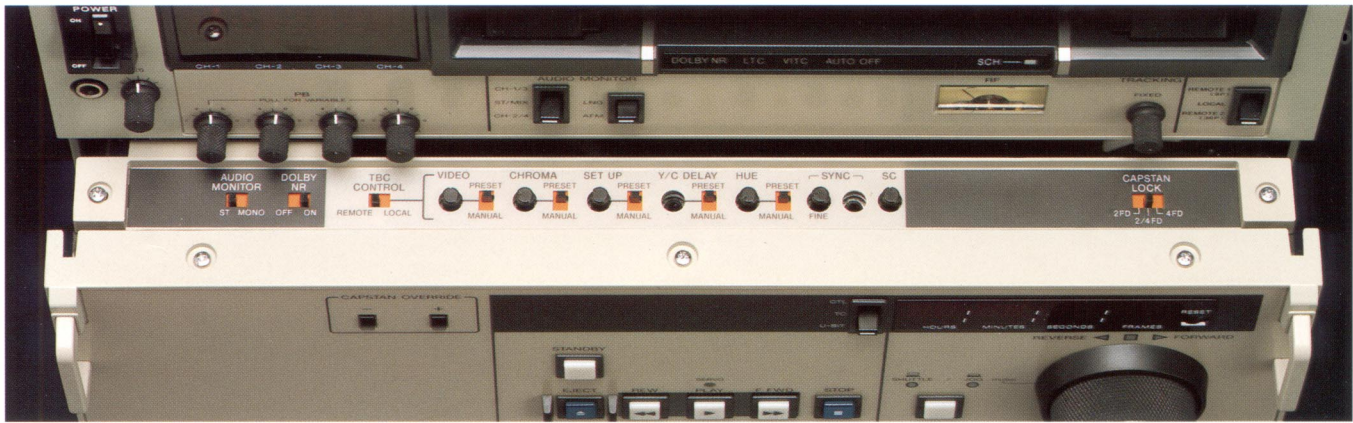
### • Component connectors

The BVW-60 provides two types of connectors for component signal output. Y/R-Y/B-Y component signal outputs are provided from the BNC connectors, in addition to the Y/R-Y/B-Y/CTDM DUB signals sent through the common Betacam 12-pin DUB/COMPONENT connectors.

## Capstan override

Normal tape speed can be varied by  $\pm 16\%$  by using the search dial or by 8% by using the TRIM buttons during the playback mode.





## Built-in TBC

Standard broadcast video output can be obtained directly from the BVW-60 with no additional time base correction required. Advanced high quality digital dropout compensation also ensures consistent picture performance.

## TBC remote control

In addition to the built-in TBC adjustment of the BVW-60, remote adjustment may be performed using a BVR-50 connected via the D-sub 15-pin cable to the rear panel connector (TBC REMOTE).

## Improved serviceability

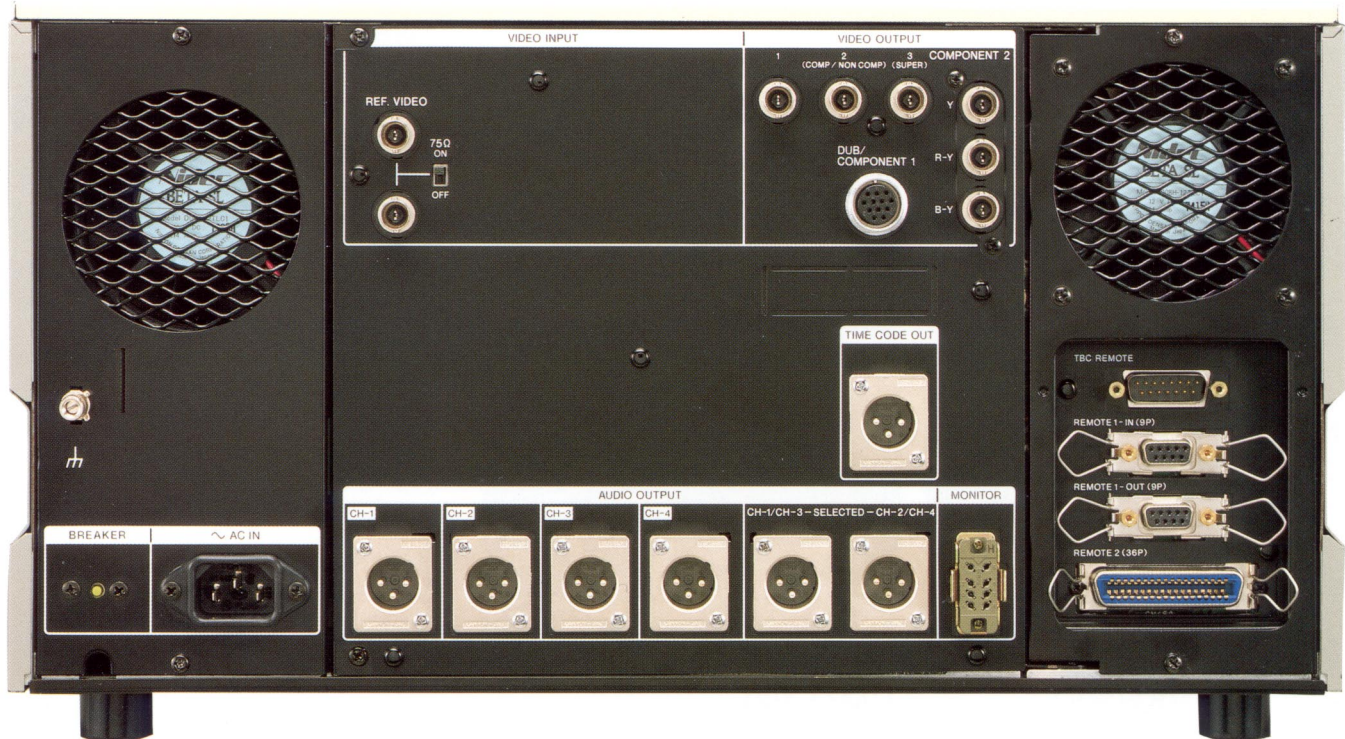
For easy maintenance and service, the BVW-60 is provided with comprehensive self-diagnostics. A digital hour meter is also equipped and it indicates the accumulated time of power on, drum rotation, tape running, and threading/unthreading.

## Initial setup

In order to meet various customized operations, many operational parameters have to be prepared for user convenience. The BVW-60 has been designed to answer these requirements with easy accessibility and simple operation. Based on the above criterion, the initial setup menu concept has been introduced into the BVW-60. The initial setup menu is scrolled and modified by the search dial while monitoring Video Output 3 or the LED Timer display. The modified menu is memorized in the non-volatile memory.

## Easy installation

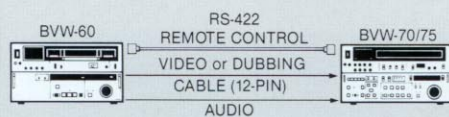
With the RMM-100, the BVW-60 can be mounted into a 19-inch rack mount without taking off the side panel. The control panel can be tilted up to 90 degrees.



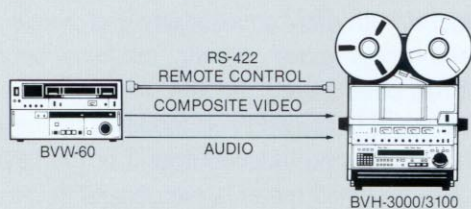


## Typical Connections

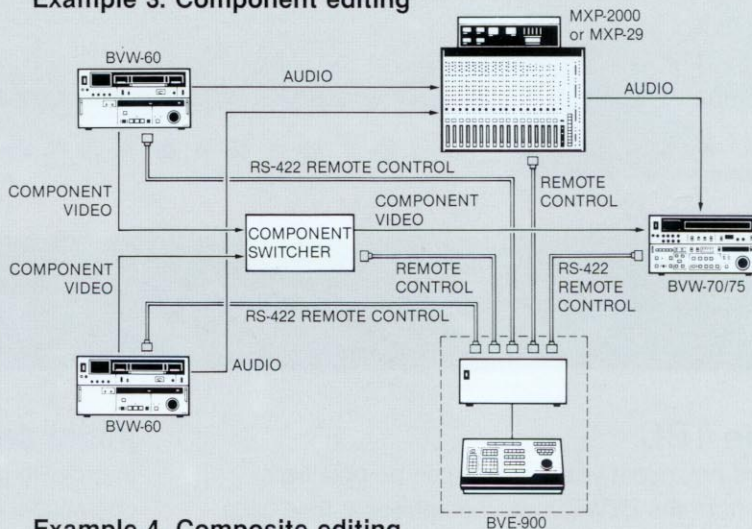
Example 1.



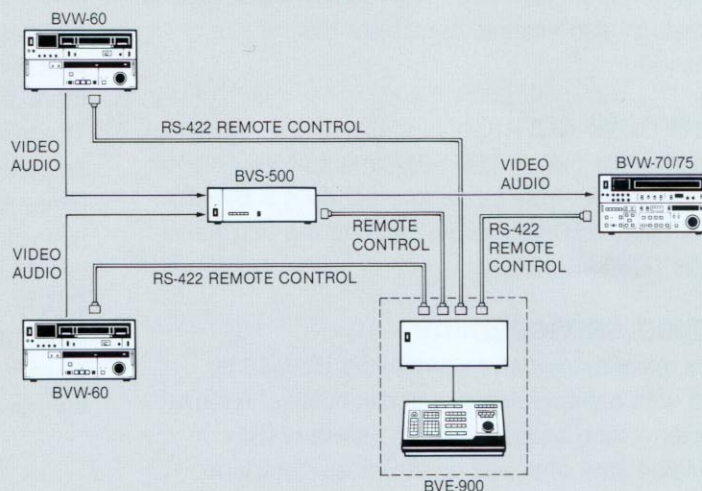
Example 2.



Example 3. Component editing



Example 4. Composite editing



## Optional Accessories



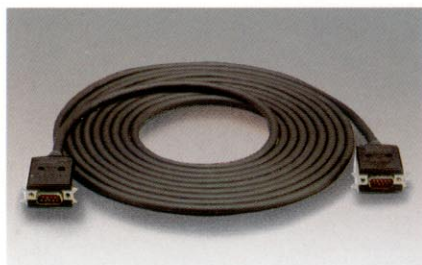
TBC Remote Controller  
**BVR-50**  
(NTSC)



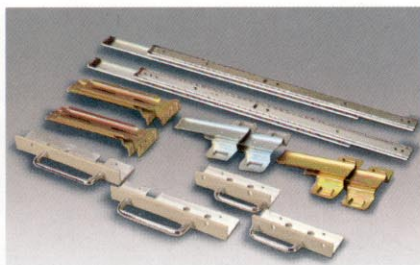
Component Color Corrector  
**BVX-10**  
(NTSC)



Videocassette Tapes  
**BCT-5M/10M/20M/30M**  
(Small Cassette)  
**BCT-60ML/90ML**  
(Large Cassette)



Remote Control Cable  
**RCC-5G/10G/30G**  
(5m) (10m) (30m)



Rack Mount Kit  
**RMM-100**

# Specifications

## Video Performance

	Metal Particle Tape	Oxide Tape
Bandwidth	30Hz to 4.5MHz $\pm\frac{1}{2}$ dB	30Hz to 4.1MHz $\pm\frac{1}{2}$ dB
Luminance	30Hz to 1.5MHz $\pm\frac{1}{2}$ dB	30Hz to 1.5MHz $\pm\frac{1}{2}$ dB
Chrominance R-Y	30Hz to 1.5MHz $\pm\frac{1}{2}$ dB	30Hz to 1.5MHz $\pm\frac{1}{2}$ dB
B-Y	30Hz to 1.5MHz $\pm\frac{1}{2}$ dB	30Hz to 1.5MHz $\pm\frac{1}{2}$ dB
S/N ratio	51dB	48dB
Luminance	(Component IN/OUT)*1 49dB (Composite IN/OUT)*2	(Component IN/OUT)*1
Chrominance AM	53dB	50dB
PM	53dB	50dB
Distortion		
Differential gain	Less than 2%	Less than 3%
Differential phase	Less than 2°	Less than 3°
K-factor (2T pulse)	Less than 2%	Less than 3%
Y/C delay	Less than 20 nsec.	Less than 20 nsec.
L.F. linearity	Less than 3% (Component) Less than 3% (Composite)	Less than 4%

\*1 Specification measured by playing back tapes recorded by component signal sources.

\*2 Specification measured by playing back tapes recorded by composite signal sources.

### General

Power requirements	AC 90 to 265V, 48 to 64Hz
Power consumption	160W
Operating temperature	+5°C to +40°C (+41°F to +104°F)
Storage temperature	-20°C to +60°C (-4°F to +140°F)
Humidity	Less than 80% (relative humidity)
Weight	Approx. 27 kg (59 lb 8 oz)
Tape speed	11.86cm/sec.
Playback time	More than 90 min. (BCT-90ML), more than 30 min. (BCT-30M)
Fast forward/rewind time	Less than 180 sec. with BCT-90ML
Search speed	
SHUTTLE	STILL, $\frac{1}{30}$ , $\frac{1}{10}$ , $\frac{1}{5}$ , $\frac{1}{2}$ , 1, 2, 5, and 24 times normal speed, forward and reverse
JOG	Frame by frame, forward and reverse
Lock up time	Less than 0.6 sec. from standby mode

### Signal inputs

REF VIDEO IN (BNC)	1.0Vp-p, 75 ohms
--------------------	------------------

### Signal outputs

VIDEO OUT 1 (BNC)	Composite video, 1.0Vp-p, 75 ohms, sync negative
VIDEO OUT 2 (BNC)	Composite video: 1.0Vp-p, 75 ohms, sync negative Non-Composite: 0.714Vp-p, 75 ohms
VIDEO OUT 3 (BNC)	Composite video, 1.0Vp-p, 75 ohms, sync negative, with or without character insertion

### DUB/COMPONENT OUT (12-pin female)

Luminance	1.0Vp-p, 75 ohms, sync negative
Chrominance	R-Y: 0.7Vp-p, 75 ohms B-Y: 0.7Vp-p, 75 ohms

### COMPONENT OUT (BNC)

Luminance	1.0Vp-p, 75 ohms, sync negative
Chrominance	R-Y: 0.7Vp-p, 75 ohms B-Y: 0.7Vp-p, 75 ohms

### AUDIO LINE OUT (XLR 3-pin male)

CH-1/2/3/4	+4dBm, 600 ohms, balanced, acceptable impedance as low as 150 ohms
------------	--------------------------------------------------------------------

### AUDIO SELECTED (XLR 3-pin male)

LINE OUT 1/2	+4dBm, 600 ohms, balanced, acceptable impedance as low as 150 ohms
--------------	--------------------------------------------------------------------

### TIME CODE OUT (XLR 3-pin male)

	2.2Vp-p, 600 ohms, balanced
--	-----------------------------

## Audio Performance

	Metal Particle Tape	Oxide Tape
Longitudinal Frequency response	50Hz to 15kHz $\pm\frac{1}{2}$ dB (at reference level)	50Hz to 15kHz $\pm\frac{1}{2}$ dB (at -10dB below reference level)
S/N ratio (at 3% distortion level)	72dB	50dB (Dolby NR off)
Distortion (T.H.D., at 1kHz reference level)	Less than 1%	Less than 2%
Crosstalk (at 1kHz reference level)	Less than -65dB	—
Phase difference	Less than 20° (at 15kHz)	—
Wow and flutter	Less than 0.1% rms	Less than 0.1% rms
AFM		
Frequency response	20Hz to 20kHz $\pm\frac{1}{2}$ dB	—
Dynamic range	More than 85dB	—
Distortion (T.H.D., at 1kHz reference level)	Less than 0.5%	—
Phase difference	Less than 10° (at 20kHz)	—
Crosstalk (at 1kHz reference level)	Less than -70dB	—

All of the specifications given above are measured by playing back Betacam SP standard tape.

### Processor adjustment range

Video level	$\pm 3$ dB
Chroma level	$\pm 3$ dB
Setup level	0 to +15 IRE
Hue	$\pm 15^\circ$
System SC phase	360°p-p
System sync phase	+3 to -1 $\mu$ sec.
Y/C delay	$\pm 50$ nsec.

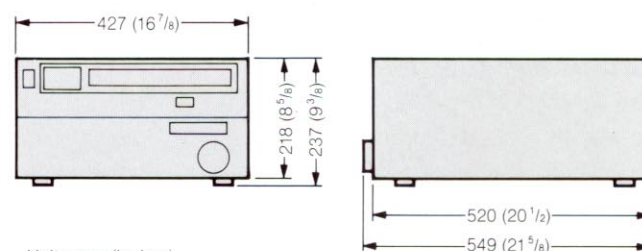
### Others

REMOTE 1 IN	9-pin, female
REMOTE 1 OUT	9-pin, female
REMOTE 2	36-pin, female
TBC REMOTE	15-pin, male
MONITOR	8-pin, female
HEADPHONES	JM-60 headphone stereo phone jack

### Supplied accessories

- AC power cord (1)
- Remote control cable RCC-5G (9-pin) (1)
- Extension board (3)
- Operation and maintenance manual (1)

### Dimensions



Unit: mm (inches)

Design and specifications subject to change without notice.  
"BETACAM" and "BETACAM SP" are trademarks of Sony Corporation.

## Distributed by